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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,378	11/23/2001	Hikaru Okamoto	216405US3	2854

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EXAMINER	
WILLS, MONIQUE M	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/990,378	OKAMOTO
	Examiner	Art Unit
	Wills M Monique	1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 November 2001* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Japanese foreign priority document(s) 2000-355722, filed November 22, 2000 and submitted under 35 U.S.C. 119(a)-(d), has/have been received and placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,3,5,6 & 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Lott et al. U.S. Patent 2001/0044373.

Lott teaches a solid polymer electrolyte fuel cell comprising: a polymer electrolyte membrane (10) having proton-conductivity; an anode (11) disposed on one surface of the polymer electrolyte membrane, and a cathode (12) disposed on another surface of the polymer electrolyte membrane; wherein the cathode comprises a first gas diffusion layer (40) joined to a second gas diffusion layer (60) in a thickness direction of the

cathode (12), and wherein the second gas diffusion layer (60) has a different characteristic as compared to the first gas diffusion layer (40). See Fig. 6 and paragraphs 22 & 23. With respect to claims 1 & 6, the second gas diffusion layer has different characteristics from the first diffusion layer, because the second gas diffusion layer has a hydrophobic gradient (¶ 23). Regarding claims 3 & 8, the first gas diffusion layer differs from the second gas diffusion layer in one of hydrophobicity (¶23). With respect to claim 5, making the electrodes by a wet papermaking process merely defines the electrodes by the process by which they can be made, rendering a product-by-process claim. Even though product - by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product - by - process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe , 227 USPQ. In the instant case, even though the electrodes were made by different processes, claim 5 is unpatentable because the electrodes of Lott are the same as the subject invention. Concerning claim 9, gas permeability of the second gas diffusion layer is larger than gas permeability of the first gas diffusion layer, because the first gas diffusion layer is affixed to an electrolyte membrane by application of pressure in the amount of 400 -10,000 pounds per square inch (¶ 22). Pressure bonding would inherently reduce the porosity, and thus, gas permeability of the first gas diffusion layer. The second gas diffusion layer is not subjected to pressure bonding (¶ 26) and thus, has gas permeability higher than the first gas diffusion layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2 & 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lott et al. U.S. Pub. 2001/0044373 as applied to claims 1 & 6 above, and further in view of Cisar et al. U.S. Pub. 2003/0068544.

Lott teaches the solid polymer electrolyte fuel cell of claims 1 & 6.

Lott fails to teach a cathode further comprising a hydrophilic intermediate layer disposed between the first gas diffusion layer and the second gas diffusion layer.

Cisar teaches that it is conventional to coat gas diffusion electrodes with hydrophilic material, so that the gas diffusion structure is capable of delivering oxygen to the electrode without flooding the fuel cell (¶42).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to coat the electrodes of Lott with the hydrophilic layer of Cisar, so that the gas diffusion structure is capable of delivering oxygen to the electrode without flooding the fuel cell. Coating electrodes in the

structure of Lott would render a hydrophilic intermediate layer between the first gas diffusion layer and the second gas diffusion layer.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Koschany et al. U.S. Patent 5,998,057.

Koschany teaches a method of making a gas diffusion electrode comprising the steps of: forming a plurality of second gas diffusion layers (col. 4, lines 20-30), and joining the plurality of diffusion layers by thermal pressing (col. 4, lines 30-40). Thermally pressing multiple diffusion layers simultaneously includes the process of forming a first gas diffusion layer by pressing one of the second gas diffusion layers. When two second gas diffusion layers are thermally pressed, the top layer is subject to pressing, thereby forming a first gas diffusion layer. With respect to the increase in density, thermal pressing inherently increases the density of the first diffusion layer by reducing the porosity of the electrode by exerting pressures of up to 500 bars (col. 4, line 20-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lott et al. U.S. Pub. 2001/0044373 as applied to claim 1 above.

Lott teaches the solid polymer electrolyte fuel cell of claim 1. The reference also teaches first and second gas diffusion layers both disposed on the separator side of the cathode.

Lott is silent to the first gas diffusion layer being disposed on the catalyst side of the cathode and the second gas diffusion layer being disposed on the separator side of the cathode. Stated differently, claim 4 requires that the gas diffusion layers circumscribe the cathode.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ diffusion layers circumscribing the cathode, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Conclusions

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mw

02/04/04

BRUCE F. BELL
PRIMARY EXAMINER
GROUP 1700